What do Haitians need after the earthquake?

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Abstract: The earthquake that hit Haiti in the beginning of 2010 led to tremendous international solidarity in the recovery effort. Despite the tons of aid sent to Haiti, relatively little is known about the effectiveness of the aid or about the continuing needs of the Haitians. Using data collected from in-person surveys with over 1,000 Haitians, we sought to quantify some of the impacts of the earthquake while determining people's relative preferences for food and other basic needs in the aftermath of the Haiti's earthquake. The results indicate that almost two-thirds of Haitians lost a friend in the earthquake, and nearly half lost a family member. People report spending more on food in the aftermath of the earthquake, and the level of food aid received does not appear to have any impact on food expenditures. Among different types of aid, Haitians state being most in need of a job – something difficult for international aid agencies to supply over the long run.

*Key words***:** best-worst scaling, aid relief, earthquake, survey, disaster, Haiti.

"*Patronizing the poor is proving to be a deadbeat strategy. Trusting those in need may be the answer*" **- Christopher Werth, Newsweek**

The earthquake that hit Haiti in the beginning of 2010 resulted in $14 billion in damages to the Haitian economy according to an estimate, which is more than two times Haiti's annual GDP (IDB, 2010). Over 220,000 people died and over 300,000 were injured. More than 105,000 homes were destroyed and more than 208,000 damaged. Over 1,300 schools and universities, and over 50 hospitals and health services centers collapsed. The President's Palace, Parliament, the Justice Palace and most of the Ministry and public administration buildings were destroyed in the earthquake (PDNA, 2010).

The disaster led to tremendous international solidarity to help Haiti recover from the tragedy. Governments and international organizations pledged money, and fundraisers took place around the world to collect money and other commodities such as water, food and clothes for Haiti. Four days after the earthquake, a flash appeal for aid was issued by the office of the United Nations Development Program (UNDP) in Haiti, which indicated the primary areas of intervention identified by 31 international organizations working in the country. The priorities included: medical services and supplies, clean water and sanitation, emergency shelter, food, family reunion, rubble removal and street cleaning (UNDP, 2010). International aid came mostly under these particular forms after the earthquake.

Numerous flights landed in Haiti in the days following the quake. Humanitarian missions continued for several months after the earthquake. But, what is the impact of the aid relief? Does the relief meet the priorities as judged by earthquake survivors themselves? Effective aid relief should match the priorities of the people in need, and therefore it is important for the Haitian government, international organizations, and Haitian NGOs to be aware of what kind of aid people need.

The overall objective of this research is to determine people's preferences for food and other basic needs in the aftermath of the Haiti's earthquake. We analyze how people value food donations compared to some other basic needs such as housing, medical care, employment, and money. In addition, some other questions will be investigated: What type and how much food aid did people receive? What is the impact of food aid on food expenditures of households? How does people's patience affects their preferences for aid relief? What is the impact of income level on preferences for "food aid"?

Background

There is not a great deal of research regarding people's needs following a natural disaster. In a study related to the allocation of Natural Disaster Relief Funds in Honduras, following Hurricane Mitch in 1998, Morris and Wodon(2003) argued that the diversified nature of relief makes it difficult to target those in needs. Referring to the case of Honduras, they pointed out that because the emergency aid consisted mostly of food, clothing and medicine, it was quite difficult to provide more relief to those who had greater losses or who became poorer because of the disaster. Morris and Wodon based on the argument that the needs for these goods are relatively similar between households, pointing out that absorption capacity of households is limited. Therefore, they suggested that allocation of relief funds be made according to the pre-disaster assets levels and the asset losses by households.

Targeting relief is a good way to achieve efficiency. However, appropriate information on beneficiaries is necessary to do so. Reliable data can also give some good perspectives about people's needs because it is not obvious the needs will be necessarily about the same across beneficiaries. Furthermore, aid relief available is more likely to be limited in most cases. There are few situations in which households might reach their full absorptive capacity. After a natural disaster, money as a primary type of aid can be sometimes very efficient in allowing people to allocate it in a way that maximizes their utility. On the other hand, it can be also less efficient when market chains are broken where people do not have a whole lot to buy. to meet their needs.

In the following we present the conceptual framework used to determine relative importance Haitians place on different types of aid relief and describe the choice experiment utilized. We also describe the survey used to implement the experiment.

Methods and data

The best-worst scaling method

To elicit people's preferences for food and other basic needs in Haiti after the earthquake, this research utilized the best-worst scaling method in an in-person survey with over 1000 Haitians. This method is rapidly becoming a popular method to study preferences because it forces people to make tradeoffs between scaled items and uses an underlying ratio scale of measurement. According to this method, consumers are presented a set of items and are requested to indicate which one is best and which one is worst (Lusk and Briggeman, 2009). Auger et al. (forthcoming) used the method in research that examined consumers' preferences with respect to social and ethical features of products across six countries. Lusk and Briggeman (2009) used the best-worst scaling method to analyze the relative importance consumers place on food values. Flynn et al. (2006) utilized the best-worst scaling method to investigate choices regarding health care. The best-worst scaling method presents several advantages. It provides more information than other measurement methods such as ranking or rating (Flynn et al., 2006). It is convenient for use of cross-national research comparisons (Cardello et al., 2010). This method provides a relevant framework to analyze people's preferences for food and other basic needs, in the context of the Haiti's earthquake.

The best-worst scaling method supposes respondents choose the two items that maximize the difference between two items on a particular scale of importance (Lusk, 2009). Considering K items on a set of choices, K(K-1) best-worst combinations is possible. By choosing one pair out of all K(K-1) possible pairs, respondents are assumed to allocate the maximum difference to this choice.

Following Lusk, we assume that α_k represents the location of value k on the specific scale of importance. An unobserved level of importance for individual i could be given as: $I_{ik} = \alpha_{k+} \varepsilon_{ik}$, where ε_{ik} is an error term introduced to take into account the difference between observed and unobserved importance.

The probability that items k and j are chosen out of the set as best and worst is equal to the probability that the difference between I_{ik} and I_{ij} is greater than all other K(K-1)-1 options in the choice set. Assuming the error term has an iid distribution, a Multinomial Logit model can be used to determine the probability, as following:

Prob (k is chosen best and j worst) = $\text{Exp}\ (\alpha_k - \alpha_j)/\sum\ (_{l=1,\ K})\sum(_{m=1,\ K})\text{Exp}[(\alpha_l - \alpha_m) - K]$.

This research used regression analysis to determine the relationship among several pairs of variable and then identify in what sense a change from one affects the other. The estimation for the parameters allows determining which commodity is overall the most preferred and which one is the least preferred. Beside the Multinomial Logit model, the count-based method is also used to establish a classification for the different types of aid relief, according to their preference level. The difference between the number of times an attribute has been chosen as most preferred and the number of times it has been chosen as least preferred is used to determine the relative importance of different types of aid. The Multinomial Logit method and the count-based method should both lead to the same results.

Figure 1: **Level for each attribute**

Housing

- House rebuilding: The government or an agency rebuild your house in a place you currently own
- Live in a tent city: You live in a tent city constructed by the government or other agencies
- No housing aid: You will not receive any type of housing aid

Food

- Food aid: You receive a monthly allocation of 2 bags of rice (25 kg), 2 gallons of oil (3.78 liters), 2 bags of bean (5.56 kg); 2 packs of milk (5.56 kg)
- No food aid: You will not receive any t ype of food aid

Medical care

- Medical aid: You can go to the doctor once a month and have the bills paid by the government or other agencies
- No medical aid: You will not receive any type of medical aid

Job

- Job aid: You find a job that meets your salary expectations
- No job aid: You will not receive any type of job aid

Money

- Money aid: You receive a monthly aid in cash of 5,000 G
- No money aid: You will not receive any money aid

This research considers five attributes for the choice experiment: housing, food, medical care, job and money. Each attribute is represented at two levels, except for housing which has three levels. As presented in figure 2, 11 aid options in total were considered. Our task was then to assign each of those options to different choice sets in the survey. A full factorial design was created in which each of the 11 aid options was either present/absent as a best/worst option. From this full factorial of 2^{11} choice options, we selected an orthogonal, main effects fraction in which the presence/absence of each option was independent of the presence/absence of the other options. The resulting design consisted of 12 best-worst questions, which were presented to each respondent. Out of the 12 best-worst questions, five questions contained four options of aid, six

contained six options and there was an additional question with ten options of aid. For each question, respondents were asked to choose which option of aid they most preferred and which one they least preferred. A typical question for this research, based on the best-worst scaling method, is presented in figure 2.

Which of the following options of aid would you most and least prefer? (*Check only one option as the most important and one as the least important*)

Most Preferred		**Least Preferred**
☐	**Food aid** (You receive a monthly allocation of 2 bags of rice (25 kg), 2 gallons of oil (3.78 liters), 2 bags of bean (5.56 kg); 2 packs of milk (5.56 kg))	☐
☐	**No food aid** (You will not receive any food aid)	☐
☐	**Medical aid** (You can go to the doctor once a month and have the bills paid by the government or other agencies)	☐
☐	**Job aid** (You find a job that meets your salary expectations)	☐
☐	**No job aid** (You will not receive any job aid)	☐
☐	**Money aid** (You receive a monthly aid in cash of 5,000 G)	☐

Figure 2: Example of best-worst question

Several hypotheses are tested in this study. First, we expected to find that "house rebuilding" is the most preferred type of aid relief. This assumption is based on the fact that it will take time to rebuild the houses destroyed in the earthquake and therefore people would be very interested to receive help for this task. In addition, building a house is a very demanding task and therefore would drive preferences for housing aid.

Second, we assumed "house rebuilding" is more preferred in Port-au-Prince than in the other areas. Houses in concrete are more common in Port-au-Prince than in rural areas (IHSI, 2009). People in rural areas can settle more easily into new places to live due to availability of free land and also because of the relative facility to construct new houses in woods.

Third, we supposed people with higher income less prefer food aid to housing, medical care and job aids. They can afford more easily to buy their food and decide on their diet choice, while access to housing, medical care and job can be more difficult to them.

Fourth, we expected to find that people with higher education level would tend to less prefer food aid than those with lower education level. This hypothesis is based on the rationale that the more educated one is the more one might be aware of negative consequences of food aid on domestic agriculture, while less educated people may care less about that.

Fifth, we supposed that people who have received food aid would spend less on food than those who have not received any food aid. The rationale of this hypothesis is based on the fact that the more food aid is available to a household, the more this household would be able to allocate some previous expenses on food to alternative uses.

Sixth, we supposed that the less patient a respondent is, the more he/she would tend to value food, money and job more than housing. The explanation to this assumption is based on the fact that it takes time to build a house while receiving food, money or getting a job does not require long waiting.

Data collection

The hypotheses have been tested using data from a survey conducted in Haiti from July 16th 2010 to August 6th 2010. The data was collected using in-person interviews. This method has been preferred to mail, Internet or telephone because most people do not use internet in Haiti and they can be hardly reachable by phone. Moreover, many households were displaced making mail an inappropriate method for this survey. People were interviewed in three different locations: Léogâne, Port-au-Prince and Jacmel. Léogâne was chosen as representative of rural areas. This place was the epicenter of the earthquake, where 80% of the houses were destroyed (PDNA, 2010). Port-au-Prince represents an urban area. It is the capital and the major city in Haiti and had the largest number of deaths and houses destroyed in the earthquake. Jacmel was selected as a third location representative of a small city affected in the earthquake.

Participants were recruited in tent cities, private residences, universities, hospitals and markets to diversify as much as possible the characteristics of the respondents. Because everyone was affected someway by the earthquake in Port-au-Prince, Léogâne and in a big part of Jacmel, we prioritized a simple random sample for the survey. Every Haitian who was living in Haiti at the time of the survey could have been in the target population. To ensure a more random sample, only one person of a specific gender was interviewed in a private residence or a tent. This rule was not applied for hospitals, universities and markets where there was less chance that respondents could have come from the same household. Particularly in Port-au-Prince, the survey was conducted in 5 tent cities: “Champ-de-Mars”, “Pétion-Ville Club”, “Place Jérémie”, “Place Ste Anne” and “Saïeh”. In Léogâne, some people were interviewed at “Hôpital Ste Croix” (Ste Croix Hospital) and “Place Anacaona”. In Jacmel, most of the respondents were recruited

from "Parc Pinchinat", the main tent city in this city. No reward was provided to participants. We explained the purpose of the survey and presented in a detailed manner the content of the informed consent sheet. If they felt comfortable with that then we invited them to answer the questions of the survey. Some people refused categorically to answer questions, pointing out that several interviewers came before to ask them questions after the earthquake but they never received any aid or help afterwards. Some other people were more cooperative and agreed to participate based on the idea that the results of this study could be of interest for the country.

To take into account the higher population in Port-au-Prince, 75% of questionnaires were assigned to this location, 15% were used for Léogâne and 10% for Jacmel[1].

This paper focuses on a sub-set of the data collected, which included questions with 385 people regarding the desirability of different types of aid relief. The original questionnaire was written in English. The survey was translated to a version in Creole, the mother tongue in Haiti, to ensure a better communication between interviewer and respondent and for a better accuracy of the responses.

The survey began with questions about how people were affected by the earthquake, followed by questions on types and quantity of aid received. Then, respondents were asked some questions about their situation in terms of housing, medical care and location before and after the earthquake. Afterwards, they were presented the choice questions, followed by some specific questions about characteristics of the respondents.

On average, 8.25% of the participants from the whole sample did not go to school at all, 20.95% have attended only primary school[2], 50.60% have been to secondary school[3], while

[1] According to projection from the 2003 Census (IHSI, 2009), Port-au-Prince had 2,296,386 inhabitants in 2009, Léogâne had 181,709 people and Jacmel had 36,693 people.

20.20% have attended a University at least for one year. The last Census in Haiti (IHSI, 2003) revealed that among the population of 5 years old and older, 37.4% did not go to school at all, 35.2% have attended primary school, 21.5% have been to secondary school and 1.1% has a university level. Repartition of the population in the survey according to education level is different from the last census. Several explanations are possible. For the survey, we considered only people of 18 years old or higher while for the Haitian Institute for Statistics (IHSI), they start from 5 years old. The last Census took place in 2003. Some changes may have occurred in the population structure within the period 2003-2010. In addition, the figures for the Census refer to the whole country where 53% of the people live in rural areas (IHSI, 2009). Because Port-au-Prince was the main area affected in the earthquake, we collected the majority of observations from this city. That is, we chose to survey those people who were affected by the earthquake. Then, the way proportions of population across locations were considered in the survey is different from the Census.

The official average income level in Haiti is 5462 G (IHSI, 2003). When the different ranges presented in the survey are considered at their average levels, the average income for the respondents is 6649.75 G. This figure is higher then the one presented by IHSI. But once again, the difference in time of collection of those data and the scale covered may have mattered in some ways.

The average age for the people surveyed is 34 years old. The results indicate that 49.3% of the respondents are males. This distribution is close to the one presented in the 2003 Census where men accounted for 48.2% of the population and women 51.8%.

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[2] Primary school is the education level range from 1st grade to 6th grade.
[3] Secondary school is the education level going from 7th grade to Philosophy class, the last class in High School in Haiti.

Results

Summary Statistics

This section presents the results for the general questions of the survey except for the choice questions. Part of the research addresses the issue of aid relief values while the other part has to do with quality of life. A whole sample of 1092 people was used for the research. 385 participants answered the version of the survey related to aid relief values presented in this paper. The other surveys were designed to determine respondents' quality of life desirability. The following results are combined responses from all respondents from the whole sample of 1092 people.

Effects of the earthquake

Table 1: How people were affected by the earthquake?

Way affected	**Percentage** [a]
Friends killed	66.91%
House destroyed	55.86%
Family members injured	50.27%
Family members killed	48.80%
House damaged	34.89%
Other way (disease, loss of business or other properties, stress, psychological problem)	20.05%
Workplace damaged/destroyed	16.20%
Personally injured	12.64%

Number of observations: 1092

[a] Note: Percentage do not sum up to 100 because people may have been affected more than one way

More than half of the Haitians surveyed had their houses destroyed in the earthquake in Port-au-Prince, Léogane and Jacmel. The proportion of houses damaged is also high (34.89%). Almost half of the people had at least one of their family members killed in the earthquake. Two

thirds of the Haitians lost at least a friend in the earthquake. Half of the respondents had at least one family member injured in the earthquake.

Types of aid received

Almost all respondents (98%) were expecting to receive some kind of aid relief after the earthquake. However, only 44% actually received aid at the time of the survey, six months following the earthquake.

Table 2: Types of aid relief received among those receiving some type of aid

Type of aid received	Percentage[a]
Water	69.96%
Food	68.28%
Medical care	59.87%
Housing aid	41.60%
Hygienic kit (Soap, toothpaste, toothbrush…)	29.41%
Professional training	5.88%
Job	4.41%
Money	3.57%
Clothing	2.52%
Other types of aid relief (….)	2.10%

Number of observations: 476

[a] Note: Percentage do not sum up to 100 because people may have been affected more than one way

Water (69.96%), food (68.28%) and medical care (59.87%) are the types of aid most people received after the earthquake among those receiving aid. About 41% received "Housing aid". In this study, Housing refers to any kind of shelter supplies people received. It does not mean "house rebuilding" because no homes were yet being rebuilt by the government or other aid agencies.

Table 3: Types of food aid received

Type of food aid received	Percentage[a]
Rice	80.00%
Cooking oil	71.38%
Beans	65.54%
Spaghetti	38.15%
Other (Meat, flour and other types of food)	28.92%
Milk	28.31%
Wheat	24.92%

Number of observations: 325

[a] Note: Percentage do not sum up to 100 because people may have been affected more than one way

Rice, beans and cooking oil are the types of food aid most people received. Eighty percent of the people who received food aid received rice, while 71.38% of the food aid recipients received "cooking oil" and 65.54% received beans. Those three major types of food aid are followed by spaghetti (38.15%), milk (28.31%), and wheat (24.92%). Around 29% of the food aid recipients received either meat, flour or other types of food.

Table 4: Quantity of rice received (per 55 lb bag)

Quantity of rice received	Percentage
½ bag	28.74%
1 bag	23.23%
More than 4	15.75%
4 bags	12.99%
3 bags	10.24%
2 bags	9.06%

Number of observations: 260

Among those who received rice, 28.74% received half of a bag and 23.23% received one bag. The rest of the people received two bags or more.

Table 5: Quantity of beans received (per 12.25 lb bag)

Quantity of beans received	Percentage
4 bags or more	23.26%
3 bags	21.40%
1 bag	20.47%
2 bags	18.60%
½ bag	16.28%

Number of observations: 165

Among those receiving beans, the amount received varied considerably across beneficiaries. Some people received four bags or more (23.26 %). The other beans recipients received three bags (21.40%), one bag (20.47%), two bags (18.60%) and one half bag (16.28%).

Table 6: Quantity of cooking oil received (per 8 lb gallon)

Quantity of cooking oil received	Percentage
1 gallon	35.78%
More than 3	23.28%
3 gallons	12.50%
2 gallons	10.78%
½ gallon	9.91%
¼ gallon	7.76%

Number of observations: 232

Most of the oil recipients received one gallon (35.78%) or more than three gallons (23.28%). The rest of the people received three gallons (12.50%), two gallons (10.78%), one half a gallon (9.91%) and one quarter of a gallon (7.76%).

Table 7: Quantity of wheat received (per 55 lb bag)

Quantity of wheat received	Percentage
1 bag	57.14%
2 bags	29.87%
½ bag	10.39%
3 bags or more	2.60%

Number of observations: 77

Wheat has not been a common type of food aid. Those who received wheat typically received a 55 lb bag. Other people received two bags (29.87%), one half a bag (10.39%) and three bags or more (2.60%).

Very few people received cash money aid. Those who did received on average 3261.90 G ($81.55). Recall, only 3.57% of the people surveyed received cash money aid.

Life after the earthquake

Table 8: Preferences regarding long term food aid

Category	Percentage
Need food aid as a permanent program	67.49%
Need food aid up to 2 years after the earthquake	9.09%
Need food aid up to 1 year after the earthquake	8.82%
Don't need food aid or don't need food aid anymore	7.90%
Have no opinion	6.70%

Number of observations: 1089

When directly asked, a majority of Haitians (67.49%) indicated that they would like to be part of a permanent food aid program. Only 7.90% of people are opposed to permanent food aid. Some people would prefer instead to receive food aid either for one year (8.82%) or two years only (9.09%).

Table 9: Variation in food expenses compared to 6 months before the earthquake

Variation in food expenses	Percentage
Have no opinion	0.37%
Much more (More than 25% increase in spending)	49.59%
Somewhat more (0 to 25% increase in spending)	32.72%
About the same	6.87%
Somewhat less (0 to 25% decrease in spending)	9.81%
Much less (More than 25% decrease in spending)	0.64%

Number of observations: 1091

A majority of Haitians who participated in the survey (more than 82%) affirmed spending more on food than what they used to spend 6 months before the earthquake. Only some 10% of respondents spent less on food in 2010, while 6.87% spent about the same amount as before.

Table 10: Reasons stated for increase in food expenditures

Reasons	Percentage [a]
Inflation	84.74%
More people to feed	32.07%
Depreciation of national currency (gourde)	18.82%
Other reasons (eat out, relocation…)	12.81%

Number of observations: 898

Note: [a] Percentage do not sum up to 100 because people may have been affected more than one way

The increase in food expenditures is explained mostly by inflation (for 84.74% of people surveyed) and the increase in size of households (32.07%). The monthly inflation rate jumped to 3.5% after the earthquake in February 2010 and later dropped to -1.3% in March. However, the trend for the annual inflation rate has been steady around 6% from June to July (BRH, 2010). Some other reasons such as “eat out” or “relocation” also explain the increase in expenditures on food for some people.

Table 11: Reasons stated for decrease in food expenditures

Reasons	Percentage [a]
Unable to spend more	76.32%
Other reasons	30.70%
Food aid	22.81%
Less people in household to feed	7.89%
"Budget cut" strategy	5.26%

Number of observations: 114

Note: [a] Percentage do not sum up to 100 because people may have been affected more than one way

In a few cases, respondents reported a decrease in their expenditures on food. The main reason is "lack of purchasing power" (76.32%). The impact of food aid on decreases in expenditures for food is very limited. Only 22.81% of people who decreased their expenses on food did so because they received food aid.

Table 12: Quantity and quality of meals eaten per day

Quantity and quality of meals per day	Percentage
Rice, beans, maize, wheat, bread only available: 1 meal a day	26.38%
Rice, beans, maize, wheat, bread only available: 2 meals a day	31.53%
Rice, beans, maize, wheat, bread only available: 3 meal a day	8.55%
Rice, beans, maize, wheat, plantain, milk, fruits, meat, vegetables, bread: 1 meal a day	9.93%
Rice, beans, maize, wheat, plantain, milk, fruits, meat, vegetables, bread: 2 meal a day	13.42%
Rice, beans, maize, wheat, plantain, milk, fruits, meat, vegetables, bread: 3 meal a day	10.20%

Number of observations: 1088

Most of the respondents have a non-diversified diet which includes some key components of traditional Haitian dishes such as rice, beans, maize, plantain and meat. They eat either two meals a day (31.53%) or one meal a day (26.38%). Some people, even though they cannot afford a diversified diet, have anyway the opportunity to have three meals a day.

When it comes to a more diversified diet, 13.42% of participants had two meals a day, 10.20% had 3 meals and 9.93% had 1 meal.

Table 13: Status in the house people were living in before the earthquake

Status	Percentage
Rented house	54.75%
Own house	26.91%
Parents house	17.05%
Friends house	0.92%
Other	0.28%
Job's allocated house	0.09%

Number of observations: 1085

Rent (54.75%) was the most common type of ownership for houses before the earthquake. Houses' owners represented 26.91% of people interviewed. Some respondents (17.05%) were living with parents before the earthquake.

Table 14: Types of houses people were living in before and 6 months after the earthquake

Type	Before	After
House covered with metallic or plastic sheet	43.24%	26.89%
House in concrete with *more* than 1 level;	31.30%	7.18%
House in concrete with 1 level;	25.46%	8.84%
Tent	0.00%	56.72%

Number of observations: 1086

Houses in concrete (56.76%) were the predominant type of housing people were living in before the earthquake. They could have one level or more. Some others had metallic or plastic cover and represented 43.24% of the houses. Six months after the earthquake, tent was the predominant type of housing. More than half of the Haitians surveyed (56.72%) were living in tents in three among the most affected regions.

Table 15: Types of housing that described better people's situation 6 months after the earthquake

Type	Percentage
Tent city	35.24%
Self built tent close to damaged house	22.60%
Damaged house	19.10%
Other	9.04%
Undamaged previous house	7.29%
New rented house	6.09%
New bought house	0.46%
Job's allocated house	0.18%

Number of observations: 1084

Some of the people living in tents were living in tent cities (35.24%) while the others built a tent nearby their damaged houses (22.60%). Twenty percent of the respondents were living in their damaged houses and only 7.29 % were living in undamaged houses. A few people (6.09 %) have rent new houses to live.

Table 16: Approximation of the percentage of medical care coverage

Range of bills covered	Percentage
Have no medical coverage	61.47%
100 % of the bills covered	21.20%
Approximately 75 % of the bills covered	13.36%
Approximately 25 % of the bills covered	3.96%

Number of observations: 1085

Almost 62% of the Haitians interviewed had no medical coverage of any kind at the time of the survey. 20% of the people have a full coverage, while some 13.36 % have a partial coverage with 75% of the bills paid. However, this coverage refers in most cases to medical care provided for free for people living in tent cities. It does not mean necessarily "Health insurance".

Demographics

Table 17: Time preference

Discount rate	Percentage of people
Less than 90%	9.93%
90 % or more	90.07 %

Number of observations: 1078

In this study, we have used the discounted utility (DU) model, proposed first by Paul Samuelson in 1937 (Frederick, S., Loewenstein, G., and O'donogue, T., 2002), to study time preference for the Haitians. A key assumption of the DU model is that it condenses the inter-temporal choices into a single parameter: the discount rate. To come up with a discount rate, we have asked the respondents to choose between two options. In option A, they could have 5000 G now and in option B, they would have 5025 G in one year. While the amount in option A stays the same, the amount in B varies progressively. The discount rate for an individual is considered as the mean between the points where they switch from A to B. A high discount rate corresponds to low patience while a low discount rate means a higher willingness to wait.

Results of the survey suggest that the people interviewed were highly impatient. 90 % of the Haitians have a discount rate greater than 90%. They would rather trade almost any amount of money they can get in the future for 5000 G (125 USD) they can have "now". Most of the people explained that if they have money, they can put it at work and get in one year a return on investment even higher than 100% and therefore take care of their family. Another response that often came whenever they were asked about their time preference was "I don't know when I am going to die". The survey did not compare people's perception of their vulnerability before and after the earthquake, however we discovered that most of the people felt they were vulnerable and would prefer the better life they can have "now" to the best life to come.

Table 18: Approximately monthly income

Monthly income*	Percentage of people
Less than 5000 gourdes (Less than 125 $US)	74.11%
Between 5000 and 20000 gourdes (Between 125 $US and 500 $US)	21.96%
Between 20001 gourdes and 50000 gourdes (Between 500.025 $US and 1250 $US)	3.27%
Between 50001 gourdes and 100000 gourdes (Between 1250.025 $US and 2500 $US)	0.56%
More than 100000 gourdes (More than 2500 $US)	0.09%

Number of observations: 1070
Exchange rate: 40 gourdes= $ 1 US

Three quarters of the Haitians who responded to the survey have a monthly income less than 5,000 G ($ 125). Only 20% people have a monthly income between 5,000 G ($ 125) and 20,000 G ($ 500). In some few cases (3.92%), the income has been more than 20,000 G ($ 500).

Table 19: Location where the people interviewed were living before the earthquake and 6 months after

Location	Percentage before	Percentage after
Port-au-Prince	75.21%	74.65%
Léogane	15.45%	15.54%
Jacmel	8.05%	8.14%
Other	1.30%	1.67%

Number of observations: 1081

We were looking at whether they had been a significant movement of population six months after the earthquake. The results indicate that people basically were still living in the same location where they used to live before the earthquake. Seventy five percent of the respondents were living in Port-au-Prince six months after the earthquake. Around 15 % were

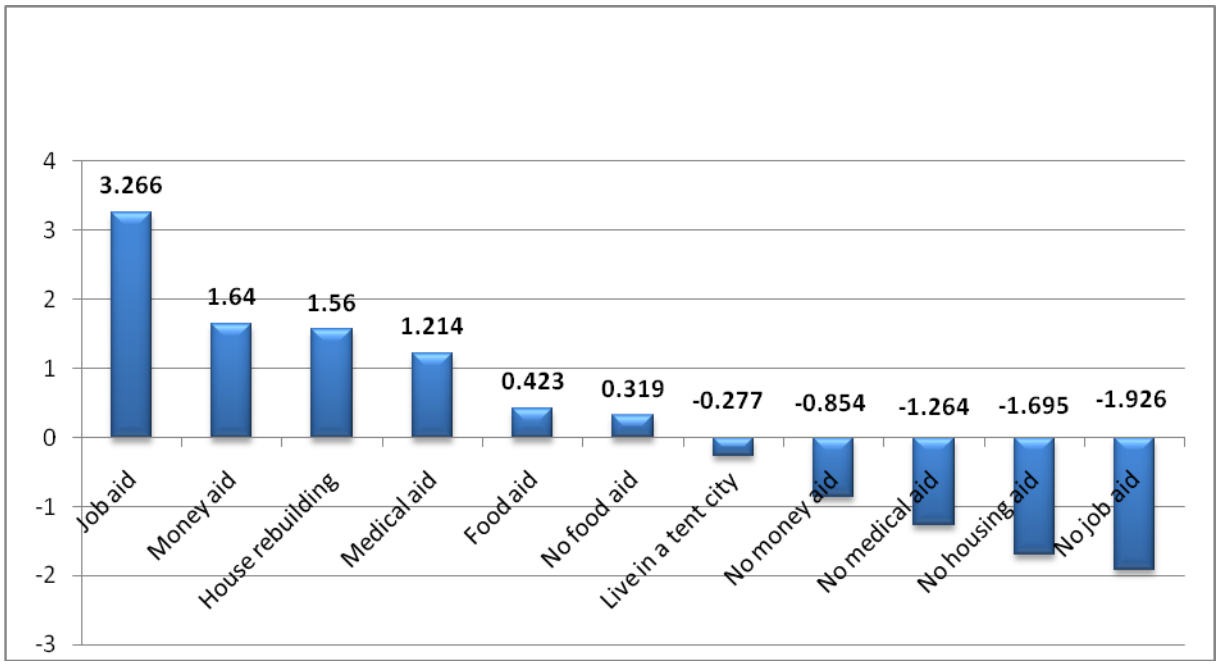
living in Léogâne where the epicenter of the earthquake was, while 8.14 % of the respondents were living in Jacmel. Almost seventy five percent of the respondents used to live in Port-au-Prince, 15.45 % in Léogâne and 8.05 % in Jacmel before the earthquake.

Econometric Analysis

Preferences for aid relief

This section presents the results about preferences for different types of aid relief in Haiti after the earthquake. Recall, five options of aid were considered: housing, food, medical care, job and money. Two levels, for each type of aid, except for housing, were presented in the survey. One level had to do with receiving a certain level of a particular type of aid, while the other level was "not receiving" this particular type of aid at all. Using the count-based method, the relative importance score is calculated as the difference between the number of times an aid option has been chosen as most preferred and the number of times it has been chosen as least preferred.

Figure 3: Relative importance of different options of aid relief



Number of observations: 364

Results from the count-based method indicate that "Job aid" is above all the most preferred type of aid relief in Haiti, after the earthquake. On average, people chose "job aid" as the most desirable type of aid 3.266 more times than they chose it as the least desirable type of aid. Cash money ($125 monthly) comes second but with more than 1.5 point differences in the means compared to job. The Haitians surveyed chose cash money aid 1.64 times as most preferred than it is chosen as least preferred. "Money aid" is followed by "House rebuilding", but with a very small difference in the means of those two options. "Medical aid" and "Food aid" are the fourth and fifth most desirable types of aid. Respondents picked "Live in a tent city" as least preferred more times than they picked it as most preferred (-0.277). As well, they picked "no food aid" as most preferred more times than they chose it as least preferred. "No job aid" is among all the options the least preferred (-1.926). Not having a job would make the people surveyed worst off than anything else.

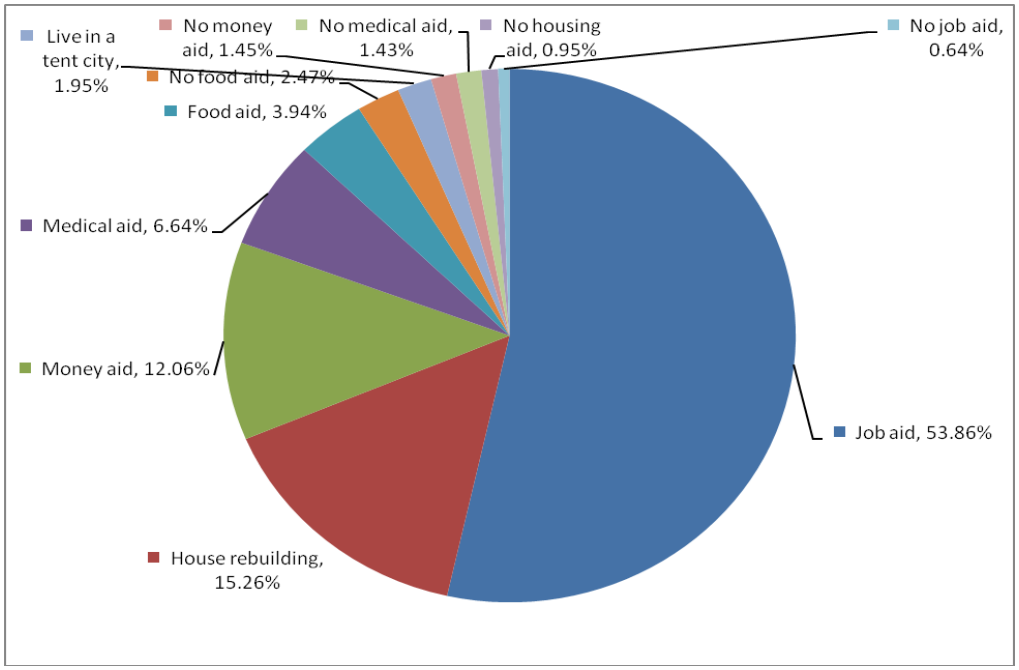
In fact, we did not confirm the hypothesis that "house rebuilding" is the most preferred type of aid. Fifty five percent of the respondents rented the house where they used to live before the earthquake. The fact that they did not own the house might have decreased their interest for the "house rebuilding" option, since they had no guarantee they would benefit themselves from this aid. Another possible explanation for the rank of "house rebuilding" is the time necessary before this aid is effective. Enjoying the benefits of "job aid" or "money aid" do not require a lot of waiting and can generate in a short term quick impacts on people's life while "Housing rebuilding" might require much time.

Beside the utilization of the count-based method to rank preferences, the Multinomial logit method has been used to estimate the model. Then, preference shares are calculated, based on the following:

$$\text{Prob}\{\text{option j is chosen}\} = \frac{e^{XB_j}}{\sum_{k=1}^{J} e^{XB_k}}$$, where $V_j=XB_j$ is utility for option j and $V_k=XB_k$ is utility for option k.

Estimation of the Multinomial Logit model leads basically to the same ranking as for the count-based method. A minor difference appears for the rank of "House rebuilding" and "Money aid". "House rebuilding" has the second highest share of preference, while this option was ranked third from the count-based method. "Money aid" has the third highest share of preference from the results of the Multinomial Logit model. However, it ranked second from the count-based method.

Figure 4: Preference shares for different options of aid



Preferences for different types of housing aid according to geographic location

From the results of the estimation (Table 22), there is not enough evidence to conclude that preference for "House rebuilding" for people in Léogâne is different from preference for people in Port-au-Prince. It is the same for Jacmel. There is not enough evidence to say that preference for "House rebuilding" in city is different from preference in Port-au-Prince.

However people interviewed in Jacmel most preferred the option "Live in a tent city" than people in Port-au-prince. In Léogâne, the people surveyed were more hostile to live in a tent city than people in Port-au-Prince. The reason behind the higher preference for the choice "Live in a tent city" in Jacmel could be the difference in proportion of people living in tent cities who have received aid. Only 44% of people surveyed in Port-au-Prince and Léogâne have received aid, while in Jacmel this figure is double. Seventy eight percent of respondents in Jacmel were still receiving food aid six months after the earthquake, while this number is only 2.3% in Port-au-Prince. Most of the people surveyed in Jacmel were living in a tent city, received food aid on a regular basis and were receiving water and medical care. They were experiencing a quality of life some of them did not necessarily have before. Therefore, they felt more comfortable to live in the tent city than people from other places.

Preferences for aid relief according to income level

Income level is not a significant factor in people's desirability for some specific types of "aid relief". At 5% significance level, we do not have enough evidence to conclude that preference for "House rebuilding", "Live in a camp", "Food aid", "Job aid" and "Medical aid" is different for people who earn monthly between 5,000 G to 20,000 G and those who earn less

5,000 G or for people who earn more than 20,000 G and those who earn less than 5,000 G. Except for "Money aid", people with a higher income are less interested in receiving this type of aid than people with lower income.

Preferences for aid according to education level

There is not sufficient evidence to say that preference for food aid is different for people who have attended only primary school and those who have not been to school at all or for people who have been to secondary school and the people who have not been to school at all (Table 22). However people who have attended at least one-year University have statistically a lower preference for food aid than people who had never been to school. Those respondents with university level also have less interest to live in a tent city or to receive cash money aid than the uneducated people. The results of the estimation, once again, do not give enough evidence to say that preference for "Live in a tent city" is different for "primary school" level and "no school at all" level or for "secondary education" level and "no school at all" level. Also, those results do not allow us to conclude that preference for "Medical aid" is different for the people who have not been to school at all, compared to the other education level groups.

Impacts of time preference on people's preferences for aid

There is not sufficient evidence that time preference has been a major factor in people's choice relative to several aid options. We could not conclude whether a high or low discount rate had any impact on preferences for the options "live in a tent city", "food aid", "money aid" or "job aid". However, the results suggest that people who are less patient (high discount rate) less

prefer medical aid than people who are more patient (low discount rate) (Table 22). Also, people who are less patient show higher interest to benefit from “house rebuilding” aid.

There is not enough evidence that gender or age have significant impact on people’s desirability level for aid. However, we found that older people were more interested in “House rebuilding” aid and less interested in “Job aid” than younger people.

Conclusions and Implications

The earthquake in Haiti has been described as one of the worst natural disasters - ever. Despite the outpouring of international aid, little is known about the effectiveness of the generosity or how future efforts might be improved. This research explored what types of aid those Haitians most desired.

Although our survey focused on those people most affected by the earthquake, surprisingly, only 44% reported receiving any aid. Among factors such as employment, house rebuilding, medical care, food aid and cash money aid, the people surveyed stated being most in need of a job. "Cash money" aid and "House rebuilding" aid rank pretty much the same as second most preferred type of aid relief. The ranking for job and cash money aid reveals people's interest to have a kind of independence from constant assistance. Moreover, the option "not receive job aid" is the least preferred among the 11 options. This result suggests that "not find a job" would make people worse off than anything else. Results indicate that 82% of those surveyed currently do not have a job. Seventy four percent of the Haitians interviewed stated that they earn monthly less than 5000 G (125$)[4]. Clearly, the low incomes are a result of the low employment rate.

We found out that while the majority of the people surveyed are interested to be part of a permanent food aid program (67 %), people who have attended a university at least for one-year are less interested in receiving food aid. Also, people who have higher income are less interested in receiving money aid.

[4] The minimum wage is 40 gourdes ($5) par day. For 25 days of work in a month, the monthly minimum wage is equivalent to 5000 gourdes ($125)

This research represents an attempt to measure how people value different types of aid relief after the earthquake in Haiti. Additional work is needed. For instance, people were interviewed without any incentives. Their choice did not have any consequences on them and therefore they did not have any incitation to tell the truth. It would be interesting to see how respondents would react knowing that they would actually receive the type of aid chosen.

Moreover, the survey was conducted 6 months after the earthquake. Needs could have been different from one month following the quake. Likewise, it is uncertain whether the preferences expressed at the time of the survey will remain the same several months later. It might be then beneficial to track a panel of people in order to study stability of people's preferences for aid relief over time.

One challenge in designing the survey was to determine some equivalent levels for the attributes. For instance, what is the amount of money that is worth the same as a specific type of housing aid, a certain level of medical aid or food aid? To our knowledge, the answer to this question is unknown, and our ongoing work is aimed at answering this question.

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APPENDIX

Table 20: Expectations and donations of aid

Variable	Percentage
People who were expecting aid	97.6%
People who have received aid	43.59%

Number of observations: 1092

Table 21: Relative importance of other types of aid relief compared to food aid

Aid options	MNL Econometric Estimates	Standard Error	Preference share
Job aid	2.616	0.158	53.86%
House rebuilding	1.355	0.199	15.26%
Money aid	1.119	0.169	12.06%
Medical aid	0.522	0.171	6.64%
Food aid	0.000	…	3.95%
No food aid	-0.465	0.162	2.48%
Live in a camp	-0.702	0.211	1.95%
No money aid	-0.998	0.202	1.46%
No medical aid	-1.016	0.202	1.43%
No housing aid	-1.424	0.190	0.95%
No job aid	-1.810	0.145	0.65%
Number of individuals	364		
Number of choices	45390		
Log Likelihood	-2011		

Table 22: Impacts of time preference, education level, income, geographic location, age, gender, employment and type of aid received on preferences for aid relief

		"House rebuilding" aid		Live in a camp (Tent city)		Food aid		Money aid		Job aid		Medical aid	
	Variables	Estimates	Pr > |t|	Estimates	Pr > |t|	Estimates	Pr > |t|	Estimates	Pr > |t|	Estimates	Pr > |t|	Estimates	Pr > |t|
	Intercept	-0.896	0.283	0.129	0.830	-0.045	0.949	1.671	0.002	4.361	<.000	1.617	0.003
Discount rate for measurement of time preference	DR<90 %	0.000	…	0.000	…	0.000	…	0.000	…	0.000	…	0.000	…
	DR ≥90 %	1.008	0.027	-0.038	0.908	0.070	0.854	0.236	0.429	-0.337	0.333	-0.724	0.014
Education level	No school	0.000	…	0.000	…	0.000	…	0.000	…	0.000	…	0.000	…
	Primary school	0.036	0.941	-0.416	0.227	0.058	0.885	-0.186	0.554	0.009	0.979	0.445	0.153
	Secondary school	-0.120	0.805	-0.475	0.173	-0.158	0.697	-0.087	0.785	0.421	0.257	0.429	0.173
	University	1.136	0.061	-1.101	0.012	-1.099	0.031	-1.215	0.002	0.134	0.772	0.327	0.405
Income level	Income ≤5000 G	0.000	…	0.000	…	0.000	…	0.000	…	0.000	…	0.000	…
	5 000 < Income ≤20, 000	0.322	0.384	0.192	0.472	-0.119	0.702	-0.528	0.030	0.057	0.839	0.155	0.519
	Income >20,000G	1.007	0.178	-0.007	0.990	0.589	0.347	-0.886	0.072	-0.740	0.196	0.560	0.249
Geographic Location	Port-au-Prince	0.000	…	0.000	…	0.000	…	0.000	…	0.000	...	0.000	...
	Léogâne	0.425	0.148	-0.626	0.003	0.073	0.767	-0.146	0.451	-0.328	0.144	0.621	0.001
	Jacmel	-1.073	0.091	2.556	<.001	-0.117	0.825	-0.742	0.075	-1.463	0.002	0.568	0.168
	Other locations	2.339	0.019	-0.701	0.327	1.159	0.165	-0.426	0.515	-2.024	0.008	-0.642	0.321

		"House rebuilding" aid		Live in a camp (Tent city)		Food aid		Money aid		Job aid		Medical aid	
	Variables	Estimates	Pr > |t|	Estimates	Pr > |t|	Estimates	Pr > |t|	Estimates	Pr > |t|	Estimates	Pr > |t|	Estimates	Pr > |t|
Age in years	Age	0.038	0.000	-0.004	0.767	0.017	0.074	0.010	0.239	-0.030	0.001	-0.007	0.344
Gender (1 if male; 0 if female)	Gender	-0.073	0.789	0.163	0.407	-0.400	0.083	-0.276	0.126	0.157	0.454	-0.127	0.475
Employment (1 if have a job; 0 otherwise)	Employment	-0.120	0.761	-0.241	0.398	0.090	0.794	0.149	0.566	-0.344	0.258	0.227	0.379
Food aid (1 if have received food aid; 0 otherwise)	Have received Food aid	0.245	0.457	0.141	0.550	0.180	0.514	0.014	0.9499	-0.072	0.775	-0.335	0.117
Housing aid (1 if have received housing aid; 0 otherwise)	Have received Housing aid	0.263	0.462	0.885	0.001	0.754	0.012	-0.028	0.904	0.170	0.534	-0.110	0.635
Medical aid (1 if have received medical aid; 0 otherwise)	Have received Medical aid	-0.590	0.078	-0.242	0.315	-0.178	0.525	-0.104	0.635	0.500	0.051	0.118	0.588
		N R^2 Pr > F	375 0.1271 <.0001	N R^2 Pr > F	375 0.2158 <.0001	N R^2 Pr > F	375 0.0908 0.0026	N R^2 Pr > F	375 0.1178 <.0001	N R^2 Pr > F	375 0.1391 <.0001	N R^2 Pr > F	375 0.0772 0.0144

Number of observations: 378